

Editorial

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Infectious Disease and Biological Weapons

Prophylaxis and Mitigation

The topic of biological warfare (BW) was last covered systematically by *JAMA*, as part of a discourse on weapons of mass destruction, in August 1989.¹⁻³ That year marked the bicentennials of the French Revolution and the start of the American presidency. By year's end, 1989 also marked the collapse of the Soviet Empire, and with that the end of the cold war. The Biological Weapons Convention (BWC) had been in place since 1972; nevertheless, compliance on the part of great states, notably Russia, with that convention was the centerpiece anxiety in 1989. United States national policy was likewise concentrated on the defense of our troops in tactical combat settings.

Medical interests, notably symbolized by the World Health Organization's pleas⁴ had played a significant role in the diplomatic priority given to the BWC, and then to concern for its enforcement. Since 1989, the Persian Gulf War, the escalation of terrorism, and a recrudescence of many infections have added new dimensions to concerns for the malicious incitement of disease. Iraq was proven to have developed and militarized a rep-

ertoire of BW agents, notably anthrax spores.⁵ Terrorists achieved new levels of violence in New York, Oklahoma City, and Tokyo—and operated on ever more incomprehensible and unpredictable rationales. Having deployed chemical weapons in Tokyo and dabbled in BW, terrorists would soon be attempting to deploy BW on an increasing scale. It is not difficult to find recipes for home-brew botulinum toxin on the World Wide Web; terrorists justify this with the proposition that every citizen should have the parity of power with government. Meanwhile, the growth of biotechnology has great promise for new modes of diagnosis and therapy, but if left unchecked, advances in biotechnology will allow for even more troublesome microbiological agents of destruction.

This theme issue of *JAMA* then touches on a set of timely concerns that unite national security and public health, concerns that cry out for well-articulated convergence of the human community worldwide. Various articles in this issue touch on the historical,⁶ diplomatic,^{7,8} and legal background⁹; on mo-

dalities of diagnosis and management^{10,11}; and on case studies of small-scale BW attacks that have already been perpetrated, though amateurish in design and ending with limited malefaction.^{12,13} The needs and interests of physicians have been uppermost in the selection of articles to publish from among many excellent submissions for this issue. The medical community does indeed have a primary role in institutionalizing the prohibition of BW as a global commandment, as well as in mitigating the harm from infractions. How else can BW be described than as the absolute perversion of medical science?

The problematics of invoking humanitarian regulation of means of warfare are well understood.^{14,15} Resort to warfare is tied to the use of any means necessary for the survival of the state, including organized violence. It is mainly the peacetime behavior of states that can be regulated by international law, and this has evolved toward greater coherence and impact in an interdependent global economy. Even in the thrall of violent combat, states will also be deterred when there is a firm international resolve: Iraq did not, after all, use its massive stockpiles of anthrax.⁵ Physicians can help drive home the understanding that the habitual practice of BW would be ruinous, undermining personal security and civil order far more grievously than any other weapon likely to get in the hands of disgruntled individuals or rogue states. One sine qua non for the elimination of BW is its utter delegitimation; in the language of the Geneva Protocol of 1925, it must be "justly condemned by the general opinion of the civilized world."¹⁶

As a matter of international law, any debate has already been settled by the wide adoption of the 1972 BWC. The abnegation of biological weapons is approaching the status of a norm of international behavior, going beyond a mere contract for mutual compliance. When an international consensus can be achieved and sustained, as happened after Iraq's invasion of Kuwait, severe sanctions can be imposed by the international community. The task is to build that moral consensus¹⁷ and give it sustainability and priority over more transient aspects of perceived national interest, like commercial advantage or access to resources. We are happily less burdened by the choosing up of sides of the cold war and the strange bedfellows that process engendered. There is much to answer for in the nonchalance exhibited by most of the world when Iraq used chemical weapons in its wars against Iran and its own Kurd dissidents.¹⁸

Scrupulous adherence to the BWC on our own side, coming to the bar with clean hands, is of course an absolute prerequisite to the moral platform of BW prohibition. There is no more powerful instrument for that credibility than factually competent self-inspection.

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With regard to infectious disease and microbiologic agents, physicians in every country should insist on being empowered to scrutinize suspicious occurrences and facilities and to investigate outbreaks. I do not suggest that every physician be mandated to snoop into every commercial or governmental facility, but every physician should be free to ask for evidence of the kind of intermediating oversight that will provide assurance of legitimacy. Such machinery already governs the protection of

research subjects and of environmental safety. Knowledge that Russian physicians were freely and actively engaging their own government and military on the disposition of cold war-era BW facilities would be far more reassuring than any formal system of verification by transnational inspection (and its absence correspondingly alarming). Revival of trust will be further promoted by initiatives for joint cooperative research and public health programs, particularly in infectious disease, some of which are beginning to be emplaced.

Finally, physicians will be in the front line for remediation in the wake of BW attack. They should be alert to any constellation of disease that might be the harbinger of new outbreaks. This issue of THE JOURNAL includes an invaluable primer¹⁰ on the most likely exotic agents, otherwise hardly expected to be within the ken of most physicians. In the United States, individual clinicians would of course funnel their reports to local and state public health offices, and in turn to the national Centers for Disease Control and Prevention (Emergency Response Coordination Group, telephone [770] 488-7100).

Besides their personal contribution, physicians are in the best position to assess the readiness of local health services, police, and firefighter first-responders to deal with health emergencies. This is the same apparatus needed to deal with natural disease outbreaks—recall *Legionella* and *Escherichia coli* O157:H7 of recent vintage. The local responders also need to be trained in exercises entailing support from the Public Health Service and, if need be, military personnel. Several articles in this issue point to recent progress, and a long way still to go, in the coordination of resources among a host of US governmental agencies—federal, state, and local.^{11,19} In view of the rapid dispersal of people via jet aircraft, that coordination needs to be extended to a global venue, and this scarcely exists at all at the present time.

Joshua Lederberg, PhD *

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